Union County

2024

The Division of Water Resources (DWR) provides the data contained within this Local Water Supply Plan (LWSP) as a courtesy and service to our customers. DWR staff does not field verify data. Neither DWR, nor any other party involved in the preparation of this LWSP attests that the data is completely free of errors and omissions. Furthermore, data users are cautioned that LWSPs labeled **PROVISIONAL** have yet to be reviewed by DWR staff. Subsequent review may result in significant revision. Questions regarding the accuracy or limitations of usage of this data should be directed to the water system and/or DWR.

1. System Information

Contact Information

Complete

Water System Name:	Union County	PWSID:	01-90-413
Mailing Address:	500 N. Main Street, Suite 500 Monroe, NC 28112	Ownership:	County
Contact Person:	Nathan Lindholm	Title:	Engineer
Phone:	980-210-1996	Cell/Mobile:	--
Secondary Contact:	Aubrey Lofton	Phone:	704-296-4241
Mailing Address:	Monroe, NC 28112	Cell/Mobile:	--

Distribution System

Line Type	Size Range (Inches)	Estimated % of lines
Asbestos Cement	2-16	3.87 %
Cast Iron	2-30	0.20 %
Ductile Iron	2-42	27.31 %
Galvanized Iron	2	0.08 %
Other	2-54	3.06 %
Polyvinyl Chloride	2-16	65.48 %

What are the estimated total miles of distribution system lines? 1,232 Miles

How many feet of distribution lines were replaced during 2024? 1,250 Feet

How many feet of new water mains were added during 2024? 378,921 Feet

How many meters were replaced in 2024? 11,959

How old are the oldest meters in this system? 22 Year(s)

How many meters for outdoor water use, such as irrigation, are not billed for sewer services? 5,522

What is this system's finished water storage capacity? 20.5000 Million Gallons

Has water pressure been inadequate in any part of the system since last update? *Line breaks that were repaired quickly should not be included.* No

The Yadkin WTP raw water intake came online in February 2024, and accounts for a significant portion of the 'other' line type. Union County is expected to replace/upgrade all of its meters to AMI meters in 2025, and the statistic for oldest meters in the system will become out of date. This also accounts for the large number of meter replacements for 2024.

Programs

Does this system have a program to work or flush hydrants? Yes, Annually

Does this system have a valve exercise program? Yes, Annually

Does this system have a cross-connection program? Yes

Does this system have a program to replace meters? Yes

Does this system have a plumbing retrofit program? No

Does this system have an active water conservation public education program? Yes

Does this system have a leak detection program? No

Hydrants are routinely flushed in isolated and dead-end areas at weekly to quarterly intervals depending on location. The County also initiates hydrant flushing in response to customer complaints about taste/odor, water line and valve repairs, when hydrant inspections from the fire department indicate a need, and any other time the water in the system is suspected to have been contaminated. Additionally, flushing takes place during yearly system disinfectant conversion for the entire system.

Only priority (critical) valves are exercised annually. All other valves are exercised every three years.
On August 1, 2022 (Effective Sept 1, 2022), UC Water's Cross Connection Control Program was adopted, allowing UC Water to require testing and inspect backflow prevention devices, implement an enforcement response plan, and issue penalties for violations.

The County is in the middle of an AMI deployment that is expected to be completed by early 2025. All meters are being replaced or retrofitted depending on their age and condition to conform with the new standards.
Most residences in the County were built post-1980; this fact fulfills the general intent of a plumbing retrofit program.

Since adopting a Water Use Ordinance in 2015 (described under Water Conservation), the County has routinely communicated with customers through bill inserts, social media and email to ensure awareness of restricted water uses and noncompliance penalties. Tips for water conservation are also sent to customers frequently and made available online (www.unionconserves.com). We also conduct conservation outreach at community events and conduct water quality demonstrations at schools and plan to continue expanding such outreach efforts as opportunities become available and staffing allows.

The leak detection program has been suspended since only two leaks have been found in the entire county using acoustic leak detection. It isn't feasible to continue the program at this time due to the cost and time we put into the program, yielding so few leaks.

Water Conservation

What type of rate structure is used? Increasing Block

How much reclaimed water does this system use? 0.0450 MGD For how many connections? 1

Does this system have an interconnection with another system capable of providing water in an emergency? Yes

The County began using an increasing block rate structure in 2001, and the structure changed to be highly punitive at usage >10,000 gal/month in 2008 in response to high usage during the drought of 2007-2009. The high charges above 10,000 gal/month has reduced usage at these tiers significantly since implementation.

On May 4, 2015, the Union County Board of Commissioners adopted a new Water Use Ordinance that limits spray irrigation to a maximum of 3 days per week, year round. The Ordinance also allows for additional water restrictions during times of water shortage including drought and system capacity limitations. The County educates customers about this Ordinance through bill inserts, social media, and participation in local events.

The County has implemented a new program to connect residents with professional irrigation contractors for residential irrigation efficiency evaluations. The program was launched in April 2023.

Many of the upcoming and proposed changes to Union County's programs are driven by our Yadkin River to Rocky River Interbasin Transfer Certificate. Specifically, revisions to our hydrant use and meter replacement programs as well as the new residential irrigation program address aspects of the conservation and drought management plans approved as part of the certificate.

2. Water Use Information

Service Area

Sub-Basin(s)	% of Service Population	County(s)	% of Service Population
Catawba River (03-1)	60 %	Union	100 %
Rocky River (18-4)	40 %		

What was the year-round population served in 2024? 159,988

Has this system acquired another system since last report? No

Year-round population is calculated as the number of non-zero residential accounts x 2.96 (Union County persons per household, https://www.census.gov/quickfacts/fact/table/unioncountynorthcarolina,US/PST045219)

A shapefile of our utility is currently not available

Water Use by Type

Type of Use	Metered Connections	Metered Average Use (MGD)	Non-Metered Connections	Non-Metered Estimated Use (MGD)
Residential	59,969	9.7680	0	0.0000
Commercial	2,711	1.5600	0	0.0000
Industrial	49	0.7810	0	0.0000
Institutional	383	0.3110	0	0.0000

How much water was used for system processes (backwash, line cleaning, flushing, etc.)? 0.7320 MGD

Union County meters all connections to the system, including temporary connections such as permitted hydrant use.

The County is in the process of revising its bulk water permit and temporary hydrant meter rental programs. The changes will improve cross connection control for authorized hydrant users and are expected to reduce apparent water losses by improving water use accounting for the permit program and reducing theft from hydrants.

The system process water is significantly higher than 2023 with the new Yadkin River WTP online.

Water Sales

Purchaser	PWSID	Average Daily Sold (MGD)	Days Used	Contract			Required to comply with water use restrictions?	Pipe Size(s) (Inches)	Use Type
				MGD	Expiration	Recurring			
Chesterfield County Rural Water Company	13-20-003	0.0000	0	0.2880		Yes	No	6	Emergency
Lancaster County Water and Sewer District	29-20-001	0.0000	0			Yes	No	24,42	Emergency
Monroe	01-90-010	0.7680	126	1.9900		Yes	No	8	Regular
Wingate	01-90-030	0.3070	366		2063	Yes	Yes	6,8	Regular

Wingate's contract provides for all water required by the Town, with no maximum amount listed. Wingate is a co-applicant on Union County's IBT granting transfer from the Yadkin River Basin to the Rocky River Basin.

3. Water Supply Sources

Monthly Withdrawals & Purchases

	Average Daily Use (MGD)	Max Day Use (MGD)		Average Daily Use (MGD)	Max Day Use (MGD)		Average Daily Use (MGD)	Max Day Use (MGD)
Jan	13.1007	14.4042	May	16.4701	23.9280	Sep	17.5319	20.7110
Feb	14.4051	18.3137	Jun	20.1116	23.9570	Oct	19.7589	23.0280
Mar	14.5651	18.4630	Jul	17.7074	22.4060	Nov	14.4583	18.6360
Apr	17.1670	23.4840	Aug	17.3499	22.2170	Dec	12.8843	16.2030

Surface Water Sources

Stream	Reservoir	Average Daily Withdrawal		Maximum Day Withdrawal (MGD)	Available Raw Water Supply		Usable On-Stream Raw Water Supply Storage (MG)
		MGD	Days Used		MGD	* Qualifier	
Pee Dee River	Lake Tillery	5.2730	327	11.4700	13.0000	T	0.0000

* Qualifier: C=Contract Amount, SY20=20-year Safe Yield, SY50=50-year Safe Yield, F=20% of 7Q10 or other instream flow requirement, CUA=Capacity Use Area Permit

Surface Water Sources (continued)

Stream	Reservoir	Drainage Area (sq mi)	Metered?	Sub-Basin	County	Year Offline	Use Type
Pee Dee River	Lake Tillery	4,600	Yes	Yadkin River (18-1)	Stanly		Regular

What is this system's off-stream raw water supply storage capacity? 6 Million gallons

Are surface water sources monitored? Yes, Daily

Are you required to maintain minimum flows downstream of its intake or dam? No

Does this system anticipate transferring surface water between river basins? Yes

At the intake the source water pH and NTU is monitored daily. Colilert samples are pulled when we are notified of upstream spills, and PFAS and Algae samples are taken quarterly. The system transfers surface water from the Yadkin to the Rocky River sub-basin, as regulated by the 2017 Interbasin Transfer Certificate.

Water Purchases From Other Systems

Seller	PWSID	Average Daily Purchased (MGD)	Days Used	Contract			Required to comply with water use restrictions?	Pipe Size(s) (Inches)	Use Type
				MGD	Expiration	Recurring			
Anson County	03-04-010	1.2221	47	4.0000	2024	Yes	No	24	Regular
Catawba River Water Supply Project	29-20-002	11.4239	366	20.0000		Yes	Yes	24,42	Regular
Charlotte Water	01-60-010	0.0000	0			Yes	Yes	12	Emergency
Chesterfield County Rural Water Company	13-20-003	0.0000	0	0.2880		Yes	No	6	Emergency
Lancaster County Water and Sewer District	29-20-001	0.0000	0	3.0000	2025	No	Yes	24,42	Regular
Monroe	01-90-010	0.0000	0			Yes	Yes	8-16	Emergency

Regarding purchase from Anson County -- our new Yadkin River Water Treatment Plant was operational as of February 2024 and it offset the water that we purchased from Anson County. We purchased water from Anson County from January-February of 2024 while the plant was still offline.

Water Treatment Plants

Plant Name	Permitted Capacity (MGD)	Is Raw Water Metered?	Is Finished Water Ouput Metered?	Source
Catawba River WTP (1/2 Union)	40.0000	Yes	Yes	Catawba River
Yadkin WTP	13.0000	Yes	Yes	Pee Dee River

Did average daily water production exceed 80% of approved plant capacity for five consecutive days during 2024? Yes

If yes, was any water conservation implemented? Yes

Did average daily water production exceed 90% of approved plant capacity for five consecutive days during 2024? No

If yes, was any water conservation implemented? Yes

Are peak day demands expected to exceed the water treatment plant capacity in the next 10 years? No

The County practices year-round conservation, requiring all customers to irrigate a maximum of 3 days per week regardless of drought status.

The County has received an IBT Certificate for a new water supply from Lake Tillery on the Yadkin River in May 2017. The new water treatment plant came online in February 2024.

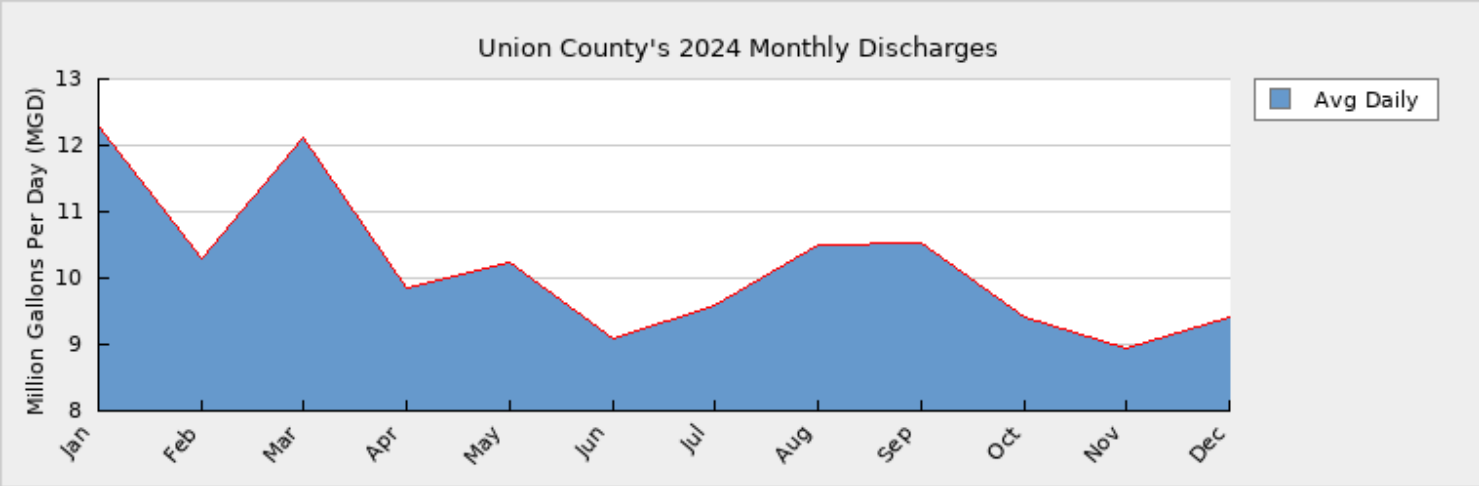
The capacity at the Catawba River Water Treatment Plant was successfully expanded from 36mgd to 40mgd in 2021. The County and its Joint Venture partner LCWSD intend to expand the facility again in the late 2020s.

The County also has a Water Use Ordinance that can be implemented during capacity constraints if needed."

4. Wastewater Information

Monthly Discharges

	Average Daily Discharge (MGD)		Average Daily Discharge (MGD)		Average Daily Discharge (MGD)
Jan	12.2810	May	10.2400	Sep	10.5310
Feb	10.2880	Jun	9.0800	Oct	9.4060
Mar	12.1110	Jul	9.5740	Nov	8.9270
Apr	9.8670	Aug	10.5050	Dec	9.4120



How many sewer connections does this system have? 43,730

How many water service connections with septic systems does this system have? 13,811

Are there plans to build or expand wastewater treatment facilities in the next 10 years? Yes

Construction for Grassy Branch WRF and 12 Mile Creek WRF will be beginning in late 2024. Capacity for 12 Mile Creek WRF will go up from 7.5MGD to 9.0 MGD, current anticipated construction completion date June 2027. Capacity for Grassy Branch WRF will go up from 0.05MGD to 0.12MGD per the negotiated Special Order of Consent, current anticipated construction completion date is December 2025.

Wastewater Permits

Permit Number	Type	Permitted Capacity (MGD)	Design Capacity (MGD)	Average Annual Daily Discharge (MGD)	Maximum Day Discharge (MGD)	Receiving Stream	Receiving Basin
NC0069523	WWTP	0.0500	0.0500	0.0220	0.1130	Clear Creek	Rocky River (18-4)
NC0069841	WWTP	1.9000	1.9000	1.1340	2.8950	North Fork Crooked Creek	Rocky River (18-4)
NC0085359	WWTP	12.0000	7.5000	5.4070	9.9300	Twelve Mile Creek	Catawba River (03-1)
NC0085812	WWTP	0.0500	0.0500	0.0460	0.3360	Crooked Creek	Rocky River (18-4)

Construction began in 2024 for expansion of Twelve Mile Creek WRF to 9MGD capacity.

Union County worked with the state on design and constraints for Special Orders by Consent (SOC) related to ongoing inflow and infiltration issues leading to exceeded capacity on permit NC0085812 (Grassy Branch WRF). The SOC was approved by Union County Board of County Commissioners on April 4th, 2022. Construction began in late 2024 to expand Grassy Branch WRF capacity from 0.05 MGD to 0.12 MGD.

Union County also has a land application system at the Olde Sycamore WRF, permit number WQ0011928. The permitted capacity of the facility is 0.150MGD, with the AADD measuring 0.045MGD and the MDD measuring 0.094MGD for 2024.

Wastewater Interconnections

Water System	PWSID	Type	Average Daily Amount		Contract Maximum (MGD)
			MGD	Days Used	
Charlotte Water	01-60-010	Discharging	2.0020	366	3.0000

Lancaster County, S.C.	29-20-001	Discharging	0.0120	366	0.0250
Monroe	01-90-010	Discharging	1.4540	366	2.6500
Marshville	01-90-015	Receiving	0.2000	366	0.3760
Wingate	01-90-030	Receiving	0.3160	366	0.7500

On April 12, 1996, Union County and the City of Charlotte entered into an agreement for Charlotte to provide up to 3 million gallons of allocated wastewater capacity to the County from the McAlpine Creek Wastewater Treatment Plant. This contract is perpetual in duration.

Our wastewater interconnect data actually does in fact indicate that the Wastewater discharge from Union County to Monroe was 1.454 MGD over 366 days, which is similar to discharges from previous years.

5. Planning

Projections

	2024	2030	2040	2050	2060	2070
Year-Round Population	159,988	183,364	212,063	248,500	290,165	345,515
Seasonal Population	0	0	0	0	0	0
Residential	9.7680	12.8360	14.8440	17.3950	20.3120	24.1860
Commercial	1.5600	1.8740	2.7960	3.9780	5.6310	6.8650
Industrial	0.7810	1.3540	2.1250	2.9290	4.0360	4.9200
Institutional	0.3110	0.4160	0.5590	0.7230	1.0320	1.2590
System Process	0.7320	1.1450	1.5380	1.9890	2.5810	3.1460
Unaccounted-for	2.5686	3.4370	4.2632	5.2679	6.5506	7.8735

The average day demand projections were developed by Union County's 2024 CWWMP by Brown and Caldwell. Population projections were calculated from average day demand projections, taking into account the percentage of residential usage in Union County's system, and the average residential gallons per capita day factor of 70.

Future Water Sales

Purchaser	PWSID	MGD	Contract Year Begin	Year End	Pipe Size(s) (Inches)	Use Type
Wingate	01-90-030	0.0400	2030		6, 8	Regular
Wingate	01-90-030	0.0800	2040		6, 8	Regular
Wingate	01-90-030	0.1000	2050		6, 8	Regular
Wingate	01-90-030	0.1100	2060		6, 8	Regular
Wingate	01-90-030	0.1300	2070		6, 8	Regular

Future Supply Sources

Source Name	PWSID	Source Type	Additional Supply	Year Online	Year Offline	Type
Catawba River WTP	29-20-002	Surface	8.0000	2028		Regular
Catawba River WTP	29-20-002	Surface	8.0000	2039		Regular
Yadkin River	01-90-413	Surface	12.0000	2032		Regular
Yadkin River	29-90-413	Surface	4.0000	2044		Regular

"The County was awarded an Interbasin Transfer certificate to supply a proposed Yadkin River Water Treatment Plant to be located in northeastern Union County in May 2017. The County's IBT Certificate is based on a maximum month average daily demand per the IBT statute at the time when it was developed and approved, whereas the facility designs are for maximum day demand. The calculated ratio between the two measures was approximately 1.22. The County's IBT request of 23 MGD max month corresponds to our projected 2050 demand in the Rocky River Basin Service Area of 28 MGD for max day. The Yadkin River Water Treatment Plant came online in February 2024.

Demand v/s Percent of Supply

	2024	2030	2040	2050	2060	2070
Surface Water Supply	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000

Ground Water Supply	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Purchases	27.0000	24.0000	24.0000	24.0000	24.0000	24.0000
Future Supplies		8.0000	28.0000	32.0000	32.0000	32.0000
Total Available Supply (MGD)	40.0000	45.0000	65.0000	69.0000	69.0000	69.0000
Service Area Demand	15.7206	21.0620	26.1252	32.2819	40.1426	48.2495
Sales	0.5714	2.2970	2.2970	2.2970	2.2970	2.2970
Future Sales		0.0400	0.1200	0.2200	0.3300	0.4600
Total Demand (MGD)	16.2920	23.3990	28.5422	34.7989	42.7696	51.0065
Demand as Percent of Supply	41%	52%	44%	50%	62%	74%

The purpose of the above chart is to show a general indication of how the long-term per capita water demand changes over time. The per capita water demand may actually be different than indicated due to seasonal populations and the accuracy of data submitted. Water systems that have calculated long-term per capita water demand based on a methodology that produces different results may submit their information in the notes field.

Your long-term water demand is 61 gallons per capita per day. What demand management practices do you plan to implement to reduce the per capita water demand (i.e. conduct regular water audits, implement a plumbing retrofit program, employ practices such as rainwater harvesting or reclaimed water)? If these practices are covered elsewhere in your plan, indicate where the practices are discussed here. Union County utilizes an increasing block rate structure. Future per capita demands will be evaluated annually and addressed as needed.

In Spring 2017, Union County initiated a new water conservation messaging campaign to target customers through regular bill inserts, social media, and website education to reduce per capita water consumption.

The County is currently implementing an Advanced Metering Infrastructure (AMI) program and new customer portal to give customers near real-time access to usage and leak alerts.

Are there other demand management practices you will implement to reduce your future supply needs? On May 4, 2015 the Board of County Commissioners adopted a Water Use Ordinance that limits spray irrigation to a maximum of 3 days per week year round and allows increased restrictions in response to drought or approaching available treatment capacity. This is to help bring down the peaking factor and push out when new supply is needed."

What supplies other than the ones listed in future supplies are being considered to meet your future supply needs?

How does the water system intend to implement the demand management and supply planning components above?

Additional Information

Has this system participated in regional water supply or water use planning? Yes, Union County Water has participated in the Catawba-Wateree Drought Management Advisory Group, the Catawba-Wateree Water Management Group, and the Yadkin-Pee Dee Water Management Group

What major water supply reports or studies were used for planning? The Yadkin River Water Supply Project Inter-Basin Transfer permitting process started in 2013, Environmental Impact Statement submitted in early 2015 and finalized in early 2016, and the 2024 Comprehensive Water and Wastewater Master Plan.

Please describe any other needs or issues regarding your water supply sources, any water system deficiencies or needed improvements (storage, treatment, etc.) or your ability to meet present and future water needs. Include both quantity and quality considerations, as well as financial, technical, managerial, permitting, and compliance issues: